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## HABENARIA ORBICULATA AND H. MACROPHYLLA.

OAKES AMES.

FOR several years I have observed during my studies of *Habenaria orbiculata*, Torr., that the species as at present understood includes two very distinct forms, one characterized by a short, the other by a long, spur. Attention was first drawn to this difference by Mr. J. H. Schuette who sent me a specimen of the short-spurred form collected near Mink River in Door County, Wisconsin. Mr. Schuette regarded the Mink River plant as varietally distinct from *Habenaria orbiculata*, Torr., and requested that a description of it be published. At that time it was impossible to decide which form answered to the original description of *Habenaria orbiculata*, which Pursh had published under *Orchis* in his *Flora of North America*. Furthermore it became evident that if Pursh had described the short-spurred form, then the long-spurred form would be the *Habenaria macrophylla* of Goldie that led to an interesting botanical controversy between W. J. Hooker and Dr. John Torrey many years ago, and that was unfortunately relegated to the rank of a synonym under *H. orbiculata*.

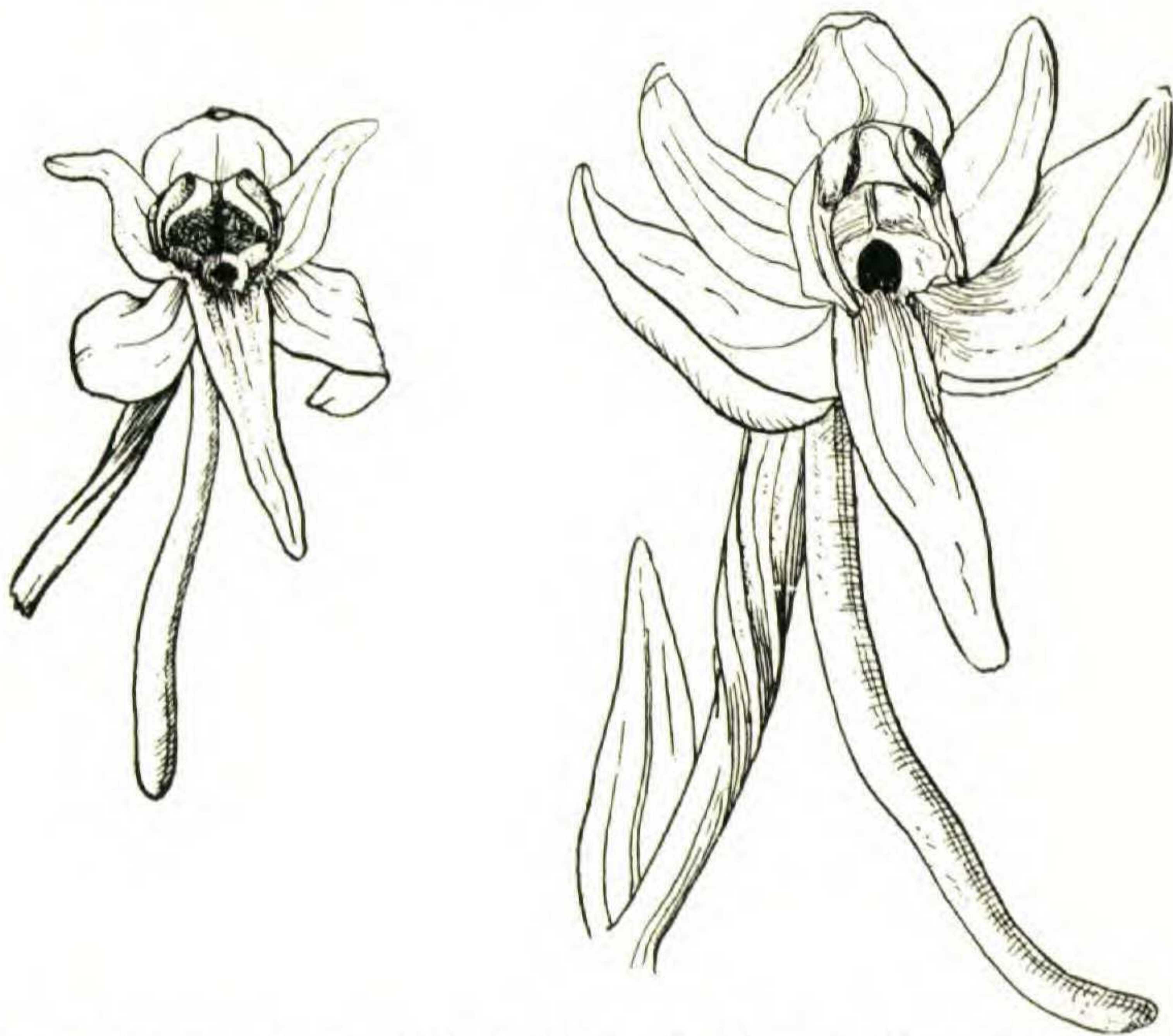
*H. macrophylla* was collected in Canada by Goldie and sent to Hooker with the following note "Orchis — This beautiful plant I found in shady woods Island of Montreal, approaches nearest to *O. orbiculata* of Pursh, of which I have not sent a specimen. However, that is very different —

"This species differs from *O. orbiculata* in being always 3 or 4 times larger, leaves more elliptic &c. in a living state, more thin and lucid, bracteas much shorter. The fl. are large & white — very rare.

"I have only seen a very few plants of it. I have one or two roots



alive." A description of this plant was published in the Edinburgh Philosophical Journal (6: 331, 1822) where the name *Habenaria macrophylla* was given to it. Subsequently in his Exotic Flora, Dr. Hooker published an excellent plate of *Habenaria Hookeri* under the name *H. orbiculata* (Pursh) and in an elaborate note indicated the differences between this plant and Goldie's *H. macrophylla*, prompted to do so, presumably, by a letter which he had received from Dr. Torrey. "It is," he writes, "with much surprise I find that my friend Dr. Torrey of New York, in a letter which he had the goodness to write to me upon the subject of Mr. Goldie's paper, considers the *H.*



Flowers of *Habenaria orbiculata*, Torr. (left) and *H. macrophylla*, Goldie (right), enlarged to the same scale.

*macrophylla*, of which he judges of course only by the description to be the same with *H. orbiculata* of Pursh, notwithstanding that the differences between these two plants are fully and satisfactorily pointed out in the Memoir in question. It will suffice here to mention, that *H. macrophylla* is twice the size of the present individual in almost all its parts, and that the anther is at each angle at base, prolonged into a projecting horn." About fifteen years later in Flora Boreali-Americana (2: 197) Hooker corrected the treatment of the Exotic Flora, and reduced *H. macrophylla* to a synonym of *H. orbiculata* with the following explanation: "This fine species, having been but ill defined by its first describer (Pursh), has been much misunderstood, and the



preceding plant (*H. Hookeri*) was by myself, as well as by other botanists, both in America and in Europe, mistaken for it. From collateral evidence, however, Drs. Torrey and Gray were led to consider the present as the true *orbiculata*; and the correctness of their ideas has been confirmed by the latter botanist, on his recent examination of the original Purshian Herbarium, in Mr. Lambert's possession."

From the preceding remarks it will be clear that *H. macrophylla* was permitted to pass into synonymy because the identity of *H. orbiculata* had been obscured by confusion with *H. Hookeri*, a related but most distinct species, and because a thorough comparison of *H. macrophylla* with the Pursh plants of *H. orbiculata* was not made. That *H. orbiculata* and *H. macrophylla* are distinguishable is in a measure proved by John Lindley's treatment of these species — which he placed under *Platanthera* — in *Genera and Species of Orchidaceous Plants*. On page 286 he brought together three species which seem clearly referable to what for convenience we may designate the *orbiculata* group. These species are *H. Hookeri*, *H. orbiculata* and *Platanthera Menziesii*. Of these we may neglect the first as its identity is unquestionable. The second is characterized in part by having the spur twice longer than the ovary, and in the synonymy which accompanies it we find *H. macrophylla*. The third, collected by Menzies on the west coast of North America — a species which does not appear in our manuals of botany, and which has remained in obscurity — is characterized by having a spur subequal with the ovary. This third species Kränzlin in his *Genera et Species Orchidacearum*, has unwittingly confused with *H. elegans*, Bolander, as to description and as to the Californian plant which he has cited as no. 6252, Bolander.

The inadequacy of Lindley's original description, and Kränzlin's discrepancies made desirable a more intimate knowledge of the type specimen. A photograph obtained at Kew by Dr. Robinson made this possible and proved conclusively that *Platanthera Menziesii* is the short-spurred form of *Habenaria orbiculata*. Subsequently I examined the type and also several sheets of specimens which Menzies had collected, and satisfied myself that the conclusions which I had drawn from a study of the photograph communicated by Dr. Robinson were correct. Lindley, then, on the supposition that the long-spurred form representative of Goldie's *H. macrophylla* was conspecific with the Pursh type of *H. orbiculata*, had considered the short-spurred form a distinct species. Having arrived at this point, it became ab-



solutely essential to know what Pursh had described as *Orchis orbiculata*. According to Pursh's *Flora Americae Septentrionalis*, *Habenaria orbiculata* inhabits the mountains of Pennsylvania and Virginia and blooms in July and August. Our present knowledge of the distribution of the species as far as the short-spurred form is concerned, extends this range to Canada and Alaska in the north, and to Minnesota in the middle west. The long-spurred form is rather rare and as represented in the principal herbaria of the United States does not reach so far south as Pennsylvania and Virginia and does not occur west of Wisconsin. Therefore, the evidence supplied by distribution would make it seem that the Pursh plant must have been characterized by a short spur. According to Pursh's *Journal of a Botanical Excursion in the Northeastern part of the States of Pennsylvania and New York during the Year 1807*, he found a *Habenaria* late in June in Pennsylvania, which he called *Orchis bifolia* because of its resemblance to the European species so called in his time. He gave an elaborate account of it and his description agrees well with the character of *H. orbiculata*, although it does not distinguish his material from the long-spurred form which Goldie called *H. macrophylla*. Unfortunately Pursh's herbarium is no longer intact as it was distributed at the sale of the Lambert collection of which it formed a part; but in my search for an authentic specimen I found at Kew a sheet which I think may be accepted as the type of his *Orchis orbiculata*. It is a sheet from his own herbarium and was presumably acquired for Dr. Hooker at the Lambert sale. The spur, which is 2 cm. long, distinguishes the plant at once from *H. macrophylla*, Goldie, and establishes the identity of *Platanthera Menziesii*, Lindley, which we must regard as conspecific with the Pursh plant.

While on the preceding pages *Habenaria orbiculata* and *H. macrophylla* have been separated by the length of the spur, the two species are readily distinguishable by other differential characters. That the spur length, however, is the most useful diagnostic character cannot be denied. It is not an arbitrary distinction and does not lead to artificial discrimination among specimens, irrespective of distribution and habitat. The diagnostic value of the spur is clearly shown by the following tabulation of length-frequencies.<sup>1</sup>

<sup>1</sup>The spurs of *Platanthera Menziesii* are not included in the measurements as Lindley's type and the British Museum specimens collected by Menzies are not fully developed.



*H. orbiculata.*

Length (mm.)	16	17	18	19	20	21	22	23	24	25	26	27	28	29
No. of cases observed,	2	2	7	7	9	4	1	2	1	3	2	1	0	0

*H. macrophylla.*

Length (mm.)	30	31	32	33	34	35	36	37	38	39	40	41	42	43
No. obs.	0	0	1	0	1	6	3	7	2	1	2	0	1	1

These figures illustrate the fact that in *Habenaria orbiculata* Torr. the most frequent spur-length is about 2 cm. and that in *H. macrophylla*, Goldie, the most frequent length is 3.5–3.7 cm. The flowers of *H. orbiculata* are considerably smaller than those of *H. macrophylla*, as is shown by the accompanying text cuts. The following shows what seems to be the most satisfactory treatment of the species herein considered.

HABENARIA ORBICULATA, Torrey, Compendium, 318 (1826).—*Orchis orbiculata*, Pursh. Fl. Am. 2: 588 (1814).—*Platanthera Menziesii*, Lindley, Orch. Pl. 286 (1835).—*Lysias orbiculata*, Rydberg, Britton's Manual 294, in part.—Spur 1.6–2.7 cm. long. South Carolina, Tennessee, Maine, westward to Minnesota and Washington, and northward.

HABENARIA MACROPHYLLA, Goldie, Edinb. Phil. Journ. 6: 331 (1822).—*Platanthera orbiculata*, Lindley, Orch. Pl. 286 (1835).—*H. orbiculata*, Britton and Brown, Ill. Fl. 1: 461 (excl. fig.).—*Lysias orbiculata*, Rydberg, Britton's Manual 294, in part.—Spur 3.2–4.3 cm. long. Connecticut to Wisconsin and northward.

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